

Appln No. 09/636,000

Amdt date January 2, 2004

Reply to Office action of October 1, 2003

REMARKS/ARGUMENTS

In the Office action dated October 1, 2003, the Examiner objected to the specification and claims 7 - 10, rejected claim 1 under 35 U.S.C. § 102 and rejected claims 2 - 5, 7, 11 and 12 under 35 U.S.C. § 103. Claim 6 was objected to as being dependent upon a rejected base claim, but was deemed allowable if rewritten in independent form including all limitations of the base claim and any intervening claims.

The above identified patent application has been amended and reconsideration and reexamination are hereby requested. Applicant has amended the Abstract and claims 1, 2, 7 and 8. Claims 1 - 12 are now pending in the application.

Response to the Objections to the Specification

The Examiner objected to the Abstract on the grounds that the first sentence of the Abstract is a sentence fragment and line 15 should be deleted. Applicant has amended the application as set forth above to clarify the Abstract.

The Examiner objected to the disclosure on the grounds that "the equations referenced on page 8, after line 5, are missing." The equations referenced at page 8, line 5 are the six lines of equations located between line numbers 5 and 10 on page 8 (labeled with Equation label "[1]").

Response to the Objections to the Claims

The Examiner objected to claim 7 on the grounds that "the class of soft decision generators" should be changed to "a class

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of soft decision generators." Applicant has amended claim 7 as recommended by the Examiner.

The Examiner objected to the use of the term "polarity" in claim 8. The meaning of the term polarity as used in claim 8 and in the specification is clear and may include states such a "0" and "1." Accordingly, Applicant asserts that the use of the term polarity is proper. Nevertheless, to expedite prosecution of this application Applicant has amended claim 8 to refer to "state" rather than "polarity." Applicant notes that this does not limit the scope of the claim in view of the prior usage of the term "polarity" in the context of claim 8.

Response to the Rejection of Claim 1 Under 35 U.S.C. § 102.

The Examiner rejected claim 1 under 35 U.S.C. § 102 as being anticipated by Cooper, U.S. Patent No. 5,502,735.

Independent claim 1 recites, in part:

means for calculating and storing the likelihood metric and survivor bit for each state of the trellis using values from said data sources, comprising means for computing supporting branch metric parameter calculations wherein branch metric parameters are computed recursively for a sequence of states, wherein said recursive computation requires only a single addition operation per branch metric parameter per state, thereby substantially reducing the number of computational steps required per branch metric parameter calculation.

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Cooper does not teach this limitation. Accordingly, Applicant requests that the rejection under section 102 be withdrawn.

Response to the Rejection of the Claims Under 35 U.S.C. § 103.

The Examiner rejected claims 2 - 5, 7, 11 and 12 under 35 U.S.C. § 103.

The Examiner rejected claims 2, 3 and 7 under 35 U.S.C. § 103 as being unpatentable over Cooper, U.S. Patent No. 5,502,735, in view of Beat, U.S. Patent No. 5,687,352.

The Examiner rejected claim 4 under 35 U.S.C. § 103 as being unpatentable over Cooper, U.S. Patent No. 5,502,735, in view of Beat, U.S. Patent No. 5,687,352, and further in view of Murakami, U.S. Patent No. 5,440,588.

The Examiner rejected claim 5 under 35 U.S.C. § 103 as being unpatentable over Cooper, U.S. Patent No. 5,502,735, in view of Hladik, et al., U.S. Patent No. 5,721,746.

Claims 2 - 5 and 7 depend on independent claim 1. Independent claim 1 recites, in part:

means for calculating and storing the likelihood metric and survivor bit for each state of the trellis using values from said data sources, comprising means for computing supporting branch metric parameter calculations wherein branch metric parameters are computed recursively for a sequence of states, wherein said recursive computation requires only a single addition operation per branch metric parameter per state, thereby substantially

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reducing the number of computational steps required per branch metric parameter calculation.

The cited references do not teach or suggest "means for computing supporting branch metric parameter calculations wherein branch metric parameters are computed recursively for a sequence of states, wherein said recursive computation requires only a single addition operation per branch metric parameter per state."

Beat describes a memory device having control circuitry that generates consecutive signals in the form of Gray code. Beat teaches nothing regarding "computing supporting branch metric parameter" or "means for providing "recursive computation [that] requires only a single addition operation per branch metric parameter per state" as claimed in claim 1.

Thus, there is no suggestion in the cited references that means for providing "recursive computation [that] requires only a single addition operation per branch metric parameter per state" may advantageously be used for "computing supporting branch metric parameter" as claimed in claim 1. Accordingly, the invention of claim 1 is not obvious in view of the cited references.

Claims 2 - 5 and 7 that depend on claim 1 also are patentable over the cited references for the reasons set forth above. In addition, these dependent claims are patentable over these references for the additional limitations that the dependent claims contain.

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The Examiner rejected claims 11 and 12 under 35 U.S.C. § 103 as being unpatentable over Jekal, U.S. Patent No. 6,035,428, in view of Beat, U.S. Patent No. 5,687,352. Claim 12 depends on independent claim 11. Independent claim 11 recites:

providing a trellis comprising a plurality of nodes corresponding to a plurality of states at a plurality of stages;

providing a present state comprising a series of bits;  
and

incrementing the present state to a next state by changing only one bit.

The cited references do not teach or suggest a method that includes the combination of "providing a trellis," "providing a present state" and "incrementing the present state to a next state by changing only one bit."

As acknowledged by the Examiner in paragraph 9 of the Office action, Jekal does not disclose incrementing the present state to a next state by changing only one bit.

Beat describes a memory device having control circuitry that generates consecutive signals in the form of Gray code. Beat teaches nothing regarding "providing a trellis" as claimed in claim 11.

Thus, there is no suggestion in the cited references that "incrementing the present state to a next state by changing only one bit" may advantageously be used to increment states for a trellis as claimed in claim 11. Accordingly, the invention of claim 11 is not obvious in view of these references since there

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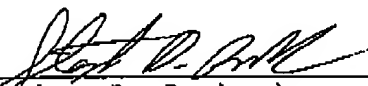
was no motivation to combine the references in the claimed manner.

Since claim 12 depends on claim 11, claim 12 also is patentable over the cited references.

**SUMMARY**

In view of the above amendment and remarks it is submitted that the claims are patentably distinct over the cited references and that all the rejections to the claims have been overcome. Reconsideration and reexamination of the above Application is requested.

Respectfully submitted,  
CHRISTIE, PARKER & HALE, LLP

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Re: Application No. 09/636,000  
Filed August 9, 2000  
Entitled MAXIMUM LIKELIHOOD SEQUENCE ESTIMATOR WHICH  
COMPUTES BRANCH METRICS IN REAL TIME

File: 50980/DBP/B600

I HEREBY CERTIFY THAT THIS PAPER IS BEING FACSIMILE TRANSMITTED TO  
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